



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2019-1008; Project Identifier AD-2019-00110-P; Amendment 39-21142; AD 2020-12-07]

RIN 2120-AA64

Airworthiness Directives; Hamilton Sundstrand Corporation Propellers

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Hamilton Sundstrand Corporation (Hamilton Sundstrand) 54H60 model propellers. This AD was prompted by the failure of a propeller blade that resulted in the loss of the airplane. This AD requires initial and repetitive eddy current inspections (ECIs) of the affected propeller blades and replacement of the propeller blades that fail the inspection. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Hamilton Sundstrand, 1 Hamilton Road, Windsor Locks, CT, 06096-1010, United States; phone: (877) 808-7575; email: CRC@collins.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA, 01803. For information on the availability of this material at the FAA,

call 781-238-7759. It is also available on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2019-1008.

Examining the AD Docket

You may examine the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2019-1008; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE. Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Maureen Maisttison, Aerospace Engineer, Boston ACO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803; phone: 781-238-7076; fax: 781-238-7199; email: maureen.maisttison@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain Hamilton Sundstrand 54H60 model propellers. The NPRM published in the Federal Register on January 28, 2020 (85 FR 4916). The NPRM was prompted by a report of the separation of a 54H60 model propeller blade installed on a United States Marine Corps Reserve (USMCR) KC-130T airplane during a flight in July 2017.

The USMCR investigation of this event revealed the Hamilton Sundstrand 54H60 model propeller blade separated due to corrosion pitting and a resultant intergranular radial crack that was not corrected at the last propeller overhaul. From this intergranular crack, a fatigue crack initiated and grew under service loading until the Hamilton Sundstrand 54H60 model propeller blade could no longer sustain the applied loads and

ultimately the blade separated. The separation of the blade resulted in the loss of the airplane and 17 fatalities. The investigation further revealed that 54H60 model propeller blades manufactured before 1971 are susceptible to cracks of the propeller blade in the area of the internal taper bore. The applicability of this AD is therefore limited to those Hamilton Sundstrand 54H60 model propellers blades with a blade serial number below 813320, which are those propeller blades manufactured before 1971.

The NPRM proposed to require initial and repetitive ECIs of the affected propeller blades and removal from service of any blades that fail these inspections. Propeller blade taper bore cracks, if not detected, could result in failure of the propeller blade, blade separation, and loss of the airplane. The FAA is issuing this AD to address the unsafe condition on these products.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The FAA received one comment, from Lockheed Martin Aeronautics Company (LMAC). The following presents the FAA's response.

Comment on Cause of Propeller Blade Separation

LMAC commented that the Discussion section of the NPRM indicated that the propeller blade separated from the KC-130T airplane as the result of corrosion that was not corrected at the last propeller overhaul. LMAC noted that the investigation completed by the U.S. Navy and the U.S. Air Force concluded that the separation was a result of a fatigue crack which grew under service loading until the blade could no longer sustain the applied loads.

The FAA revised the Discussion section of this final rule to state that the investigation concluded that corrosion pitting and a resultant intergranular radial crack was not corrected at the last propeller overhaul. From this intergranular crack, a fatigue crack initiated and grew under service loading until the Hamilton Sundstrand 54H60

model propeller blade could no longer sustain the applied loads and ultimately the blade separated. No change to this AD is required.

Comment on Difference in Compliance Time

LMAC commented that the compliance time in paragraphs (g)(1) and (2) of the NPRM differs from the time recommended by LMAC in its two applicable Alert Service Bulletins (ASBs): AV382-61-011, dated October 3, 2019, for all “382 models” (excluding the 382J) and 88/SB-723, dated November 6, 2019, for L-188 Electra aircraft types. LMAC has recommended that its customers comply with the Hamilton Sundstrand ASB 54H60-61-A154, dated August 26, 2019, within 90 days of receipt of the applicable aircraft-type LMAC ASB. LMAC stated that this 90-day compliance time was based on an aircraft-level risk assessment that considered the consequence of loss of the propeller and the probability of occurrence based on the reported cases of intergranular cracking of the blade.

The FAA applied Advisory Circular (AC) 39-8, “Continued Airworthiness Assessments of Powerplant and Auxiliary Power Unit Installations of Transport Category Airplanes,” dated September 8, 2003 (“AC 39-8”) to identify the unsafe condition and to assess the risk for propellers installed in transport aircraft. The FAA’s risk assessment for the Hamilton Sundstrand 54H60 propeller affected by this AD did not support the compliance interval proposed by LMAC in its ASBs. The FAA’s risk assessment did not justify mandating that all blades be inspected within 90 days, per the LMAC recommendation. No change to this AD is required.

Comment on Relationship between Unsafe Condition, Overhaul Period, and Blade Cracking

LMAC commented that the severity of this “hazard/unsafe condition” is not influenced by the overhaul period and there is no known correlation between time since overhaul and probability of intergranular cracking.

The FAA agrees that the severity of this unsafe condition is not influenced by the overhaul period and there is no known correlation between time since overhaul and probability of intergranular cracking. There is little established knowledge of this type of intergranular crack initiation and growth in this aluminum alloy, although an investigation has been underway for 2 years. However, the FAA has determined that since corrosion occurs regardless of whether the propeller is in service and corrosion has been discovered in blades exhibiting intergranular cracks, the appropriate compliance time uses calendar time after the effective date of this AD, based on the time of the last overhaul.

This AD employs risk-based inspections by placing priority on inspecting blades that have higher calendar time since their last overhaul because these blades have a higher probability of corrosion. In most cases, corrosion has been found to exist in conjunction with intergranular cracking. Moreover, this AD imposes a mandatory reporting requirement for cracked blades and the FAA expects that such blades will be subject to additional metallurgical examinations intended to identify factors influencing intergranular cracking. The FAA may consider further rulemaking action on this unsafe condition, depending on the results of these examinations. No change to this AD is required.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule as proposed except for minor editorial changes. These minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

Related Service Information under 1 CFR part 51

The FAA reviewed Hamilton Sundstrand Corporation ASB 54H60-61-A154, dated August 26, 2019. The ASB describes procedures for performing an ECI of the propeller blade taper bore. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Interim Action

The FAA considers this AD interim action. The root cause of the 54H60 model propeller blade separation is still under investigation. The FAA may consider further rulemaking action.

Costs of Compliance

The FAA estimates that this AD affects 212 propellers installed on 53 aircraft of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
ECI of propeller	8 work-hours x \$85 per hour = \$680	\$700	\$1,380	\$292,560

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the inspection. The FAA has no way of determining the number of aircraft that might need these replacements:

On-condition costs

Action	Labor Cost	Parts Cost	Cost per product
Replace blade	1 work-hour x \$85 per hour = \$85	\$63,500	\$63,585

Paperwork Reduction Act

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to be approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2020-12-07 **Hamilton Sundstrand Corporation**: Amendment 39-21142; Docket No. FAA-2019-1008; Project Identifier AD-2019-00110-P.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Hamilton Sundstrand Corporation (Hamilton Sundstrand) model 54H60 propellers with a blade having a serial number (S/N) below S/N 813320.

(d) Subject

Joint Aircraft System Component (JASC) Code 6111, Propeller Blade Section.

(e) Unsafe Condition

This AD was prompted by the separation of a propeller blade that resulted in the loss of an airplane and 17 fatalities. The FAA is issuing this AD to detect cracking in the propeller blade taper bore. The unsafe condition, if not addressed, could result in failure of the propeller blade, blade separation, and loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For affected propellers identified in Planning Information, paragraph 1.E.(1), of Hamilton Sundstrand Corporation Alert Service Bulletin (ASB) 54H60-61-A154, dated August 26, 2019 (“the ASB”), perform an eddy current inspection (ECI) of all blades installed on the propeller within one year or 500 flight hours after the effective date of this AD, whichever occurs first.

(2) For affected propellers identified in Planning Information, paragraph 1.E.(2), of the ASB, perform an ECI of all blades installed on the propeller within two years or 1,000 flight hours after the effective date of this AD, whichever occurs first.

(3) Perform the ECI of the affected propeller blades using the Accomplishment Instructions, paragraph 3.C. of the ASB.

(4) If any propeller blade fails any inspection required by this AD, based on the criteria in paragraph 3.C. of the ASB, remove the blade from service and replace with a blade eligible for installation prior to the next flight.

(5) For all affected propellers, repeat the inspection required by paragraphs (g)(1) through (4) of this AD at intervals not exceeding 3 years or 1,500 flight hours, whichever comes first, after the previous inspection.

(6) Report the results of the ECI required by paragraphs (g)(1) through (5) of this AD in accordance with the Accomplishment Instructions, paragraph 3.C.(6) of the ASB.

(h) Installation Prohibition

After the effective date of this AD, do not install any Hamilton Sundstrand propeller blades having an S/N below 813320 on any propeller, unless the blade has first passed the inspection required by this AD. After the effective date of this AD, do not install any propeller assemblies with affected propeller blades onto any aircraft unless the affected propeller blades have passed the inspection required by paragraph (g) of this AD.

(i) Paperwork Reduction Act Burden Statement

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to be approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including

suggestions for reducing this burden to: Information Collection Clearance Officer,
Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Boston ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k) of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Related Information

For more information about this AD, contact Maureen Maisttison, Aerospace Engineer, Boston ACO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803; phone: 781-238-7076; fax: 781-238-7199; email: maureen.maisttison@faa.gov.

(l) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Hamilton Sundstrand Corporation (Hamilton Sundstrand) Alert Service Bulletin 54H60-61-A154, dated August 26, 2019.

(ii) [Reserved]

(3) For Hamilton Sundstrand service information identified in this AD, contact Hamilton Sundstrand, 1 Hamilton Road, Windsor Locks, CT, 06096-1010, United States; phone: (877) 808-7575; email: CRC@collins.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA, 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: fedreg.legal@nara.gov, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on June 3, 2020.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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